

Patent Application No. 10/697,419
Response to Office Action dated
May 18, 2007

Attorney Docket No. 6704-30

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A nucleic acid comprising a codon-optimized nucleotide sequence encoding a *Photorhabdus luminescens* LuxA protein, wherein the nucleotide sequence has been codon-optimized for expression in mammalian cells.

Claim 2 (previously presented): The nucleic acid of claim 1, wherein the codon-optimized nucleotide sequence differs from a wild type nucleotide sequence that encodes the *Photorhabdus luminescens* LuxA protein by at least one codon substitution selected from the group consisting of: TTT to TTC; TTA, CTA, TTG, and CTT to CTG or CTC; ATT and ATA to ATC; GTT and GTA to GTG or GTC; TCT, TCA, and TCG to TCC; CCA and CCG to CCC or CCT; ACT, ACA and ACG to ACC; GCA and GCG to GCT or GCC; TAT to TAC; CAT to CAC; CAA to CAG; AAT to AAC; AAA to AAG; GAT to GAC; GAA to GAG; TGT to TGC; CGT and CGA to CGC, CGG, and AGA; AGT to AGC; and GGT and GGA to GGC or GGG.

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Claim 3 (canceled).

Claim 4 (previously presented): A nucleic acid comprising the nucleotide sequence of SEQ ID NO:1.

Claims 5-6 (canceled).

Claim 7 (original): The nucleic acid of claim 1, further comprising a regulatory element operably linked to the codon-optimized nucleotide sequence.

Claim 8 (original): The nucleic acid of claim 7, wherein the regulatory element comprises an enhancer.

Claim 9 (currently amended): A cell comprising a nucleic acid comprising a ~~codon~~ optimized nucleotide sequence encoding a *Photorhabdus luminescens* LuxA protein, wherein the nucleotide sequence has been codon-optimized for expression in mammalian cells.

Claim 10 (original): The cell of claim 9, wherein the cell is a mammalian cell.

Claim 11 (original): The cell of claim 9, wherein the cell is immobilized on a substrate.

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Claim 12 (previously presented): The cell of claim 9, wherein the codon-optimized nucleotide sequence differs from a wild type nucleotide sequence that encodes the *Photorhabdus luminescens* LuxA protein by at least one codon substitution selected from the group consisting of: TTT to TTC; TTA, CTA, TTG, and CTT to CTG or CTC; ATT and ATA to ATC; GTT and GTA to GTG or GTC; TCT, TCA, and TCG to TCC; CCA and CCG to CCC or CCT; ACT, ACA and ACG to ACC; GCA and GCG to GCT or GCC; TAT to TAC; CAT to CAC; CAA to CAG; AAT to AAC; AAA to AAG; GAT to GAC; GAA to GAG; TGT to TGC; CGT and CGA to CGC, CGG, and AGA; AGT to AGC; and GGT and GGA to GGC or GGG.

Claim 13 (canceled).

Claim 14 (previously presented): A cell comprising the nucleotide sequence of SEQ ID NO:1.

Claims 15-26 (canceled).

Claim 27 (previously presented): A nucleic acid made by the steps of:

(a) providing a polynucleotide encoding a *Photorhabdus luminescens* LuxA protein; and
(b) making in the polynucleotide at least one codon substitution selected from the group consisting of: TTT to TTC; TTA, CTA, TTG, and CTT to CTG or CTC; ATT and ATA to ATC; GTT and GTA to GTG or GTC; TCT, TCA, and TCG to TCC; CCA and CCG to CCC or CCT; ACT, ACA and ACG to ACC; GCA and GCG to GCT or GCC; TAT to TAC; CAT to CAC;

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CAA to CAG; AAT to AAC; AAA to AAG; GAT to GAC; GAA to GAG; TGT to TGC; CGT and CGA to CGC, CGG, and AGA; AGT to AGC; and GGT and GGA to GGC or GGG, wherein the resulting codon-substituted nucleic acid is expressed at higher levels when placed in a mammalian cell under expression-promoting conditions than is the polynucleotide of step (a) when placed in the mammalian cell under the expression-promoting conditions.

Claims 28-30 (canceled).

Claim 31 (previously presented): A kit for analyzing gene expression, the kit comprising:

- (a) a vector comprising
 - (i) a nucleic acid of claim 1 or claim 27;
 - (ii) at least one restriction site;
 - (iii) at least one promoter;
 - (iv) at least one selection marker; and
 - (v) at least one initiation site; and
- (b) instructions for use.

Claim 32 (previously presented): The kit of claim 31, wherein the vector further comprises an internal ribosome entry site (IRES).

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Claim 33 (previously presented): The kit of claim 31, wherein the vector further comprises an enhancer.

Claim 34 (new): The nucleic acid of claim 1, wherein the mammalian cells are human cells.

Claim 35 (new): An isolated host cell comprising a nucleic acid comprising a nucleotide sequence encoding a *Photorhabdus luminescens* LuxA protein wherein the nucleotide sequence has been codon-optimized for expression in mammalian cells.

Claim 36 (new): The isolated host cell of claim 35; wherein the isolated host cell is a mammalian cell.

Claim 37 (new): The cell of claim 35; wherein the isolated host cell is immobilized on a substrate.

Claim 38 (new): The isolated host cell of claim 35, wherein the codon-optimized nucleotide sequence differs from a wild type nucleotide sequence that encodes the *Photorhabdus luminescens* LuxA protein by at least one codon substitution selected from the group consisting of: TTT to TTC; TTA, CTA, TTG, and CTT to CTG or CTC; ATT and ATA to ATC; GTT and GTA to GTG or GTC; TCT, TCA, and TCG to TCC; CCA and CCG to CCC or CCT; ACT, ACA and ACG to ACC; GCA and GCG to GCT or GCC; TAT to TAC; CAT to CAC; CAA to

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CAG; AAT to AAC; AAA to AAG; GAT to GAC; GAA to GAG; TGT to TGC; CGT and CGA to CGC, CGG, and AGA; AGT to AGC; and GGT and GGA to GGC or GGG.

Claim 39 (new): An isolated host cell comprising the nucleotide sequence of SEQ ID NO:1.